

Figure 1: Block Diagram of Typical Apparatus for Evaluating Ultrasound Scanner

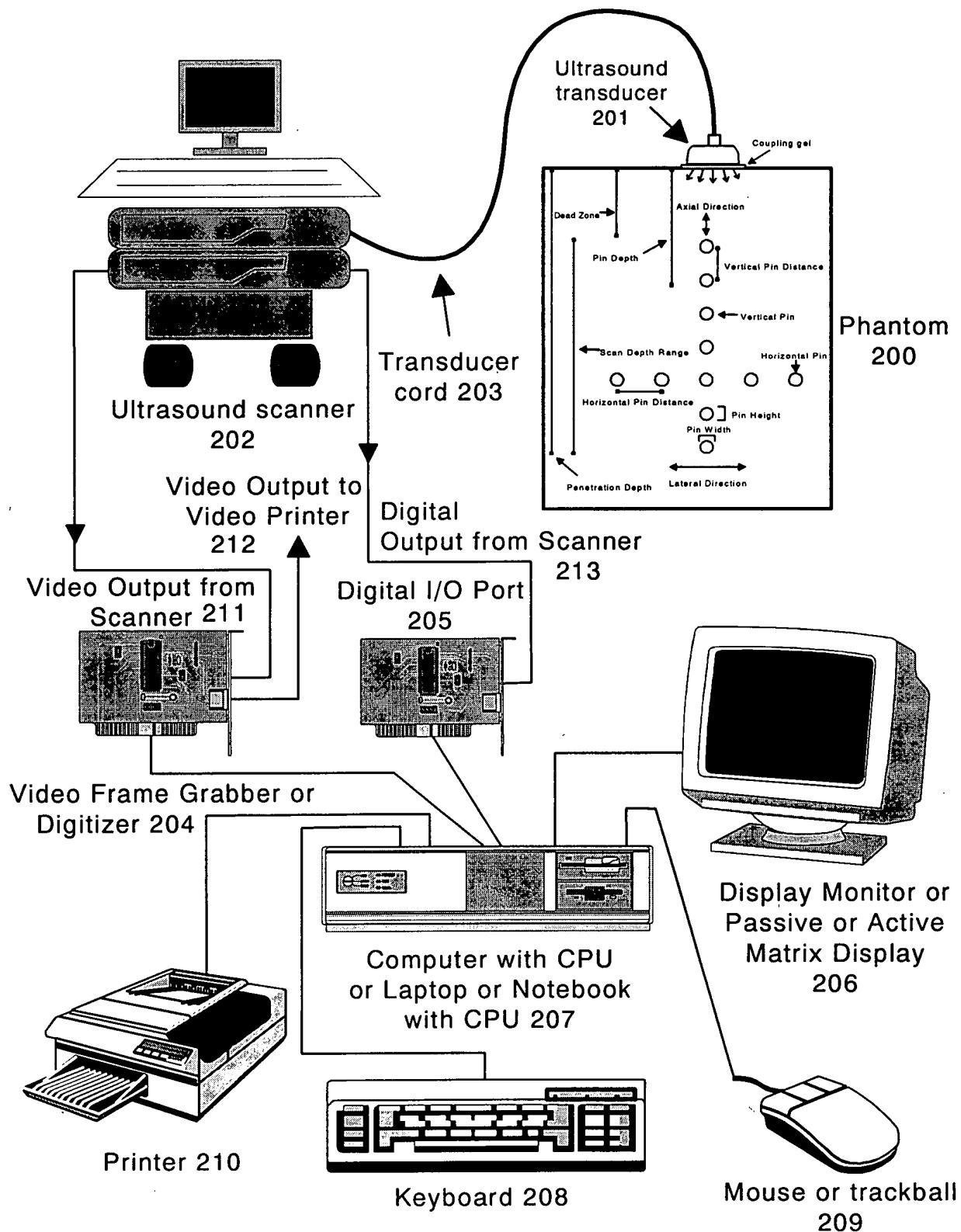


Figure 2. Processing of "Phantom Image"

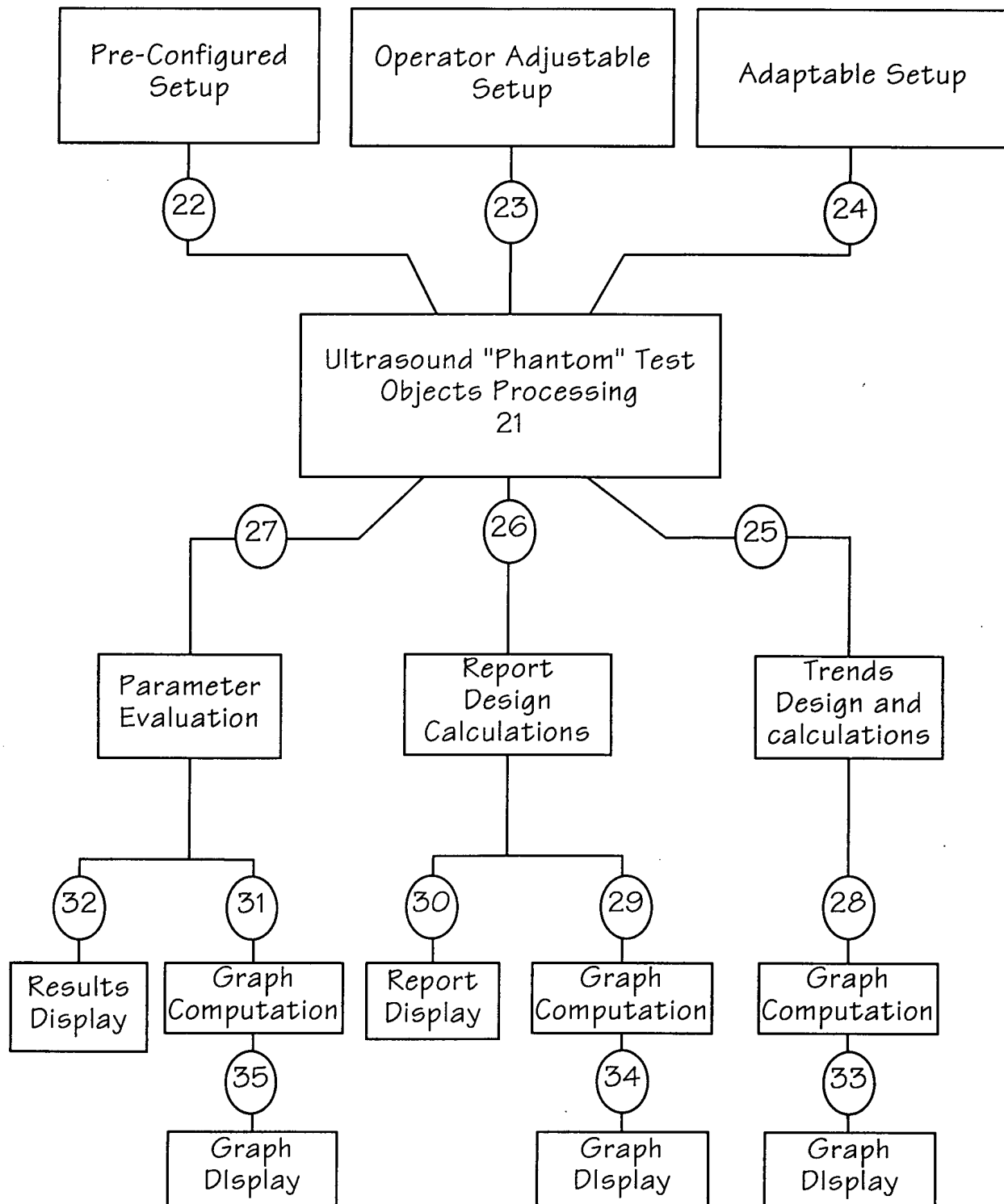


Figure 3. Parameter Evaluation Procedure

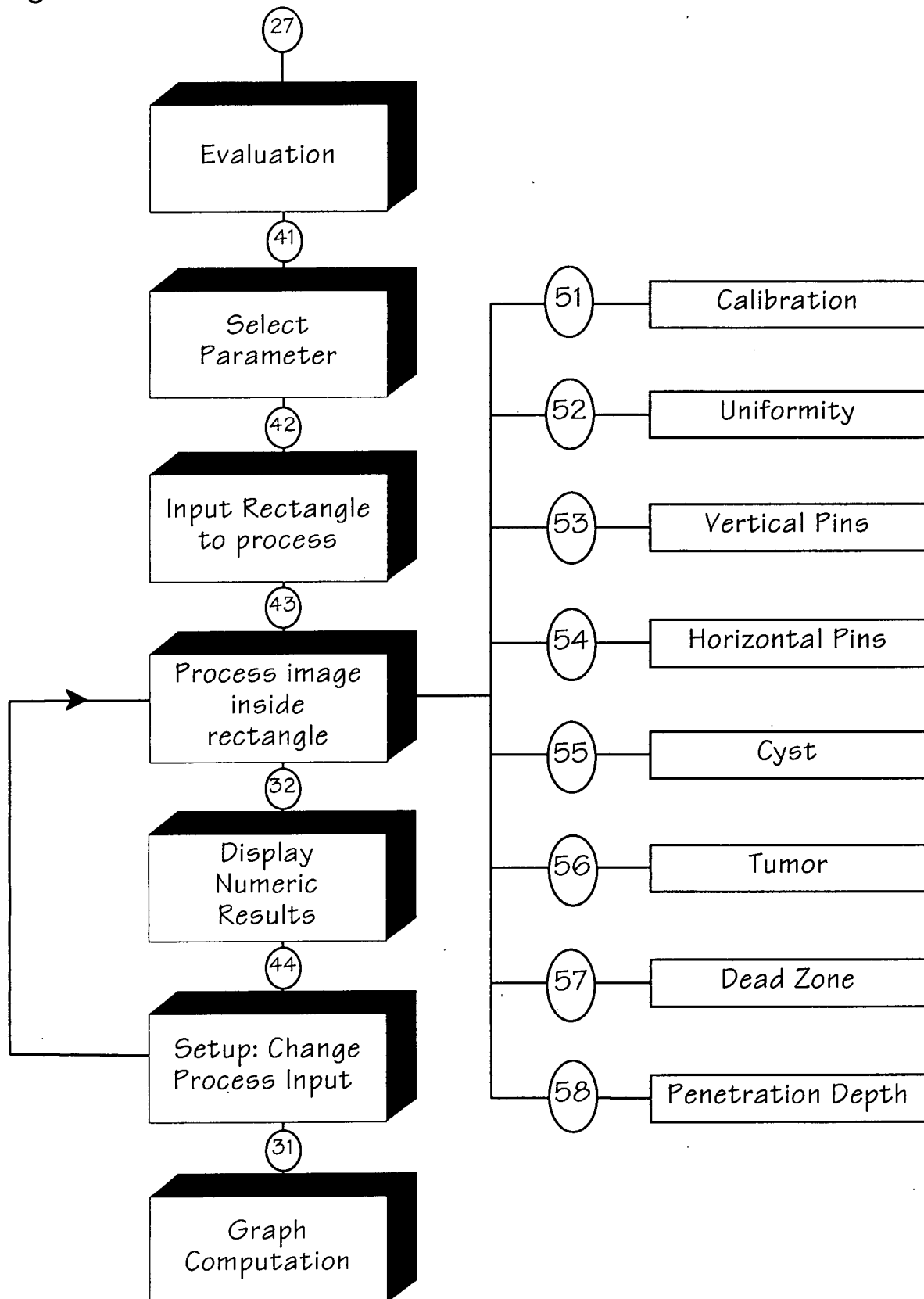


Figure 4. General Schematic-Inputs

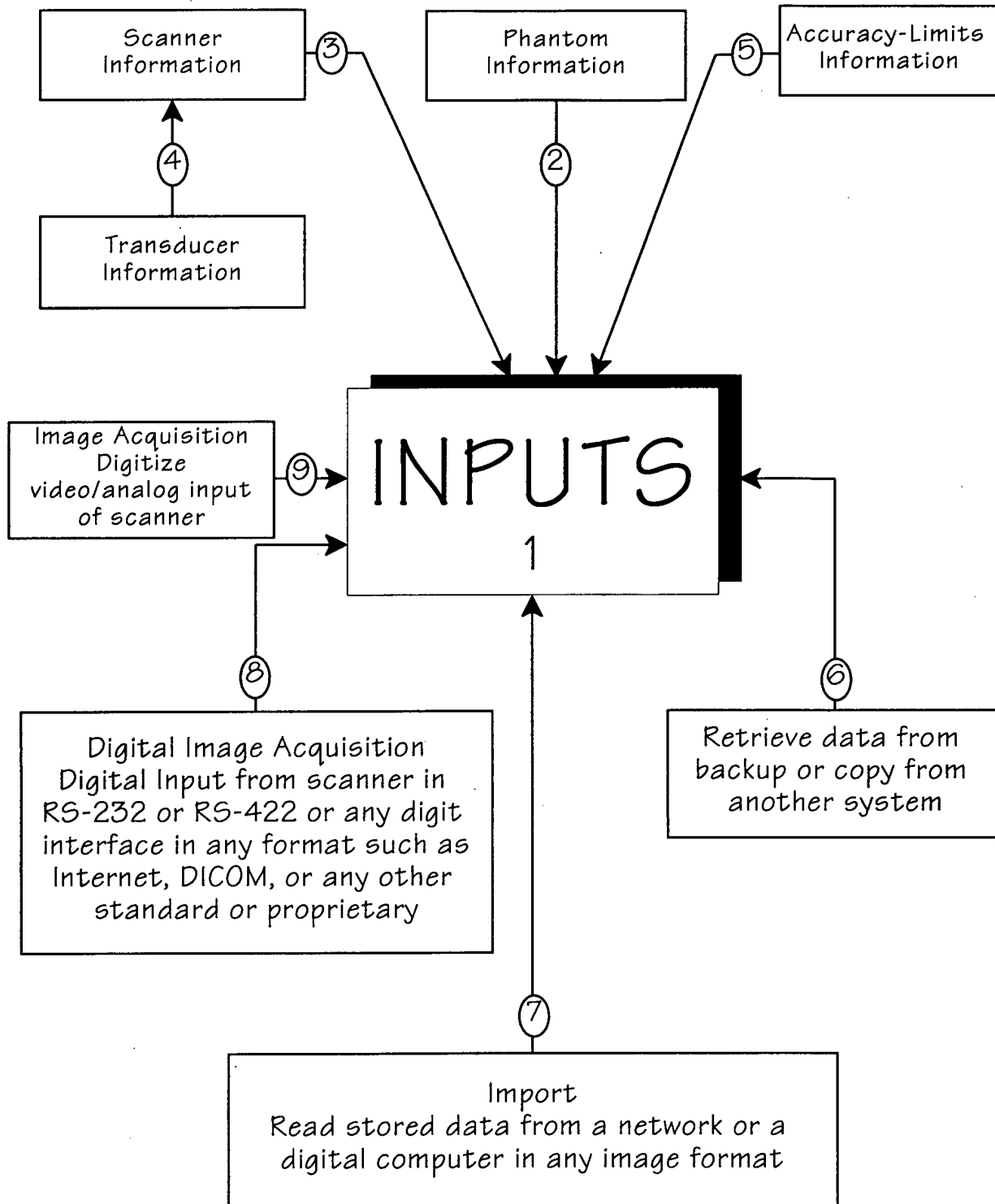


Figure 5. Phantom Test Objects

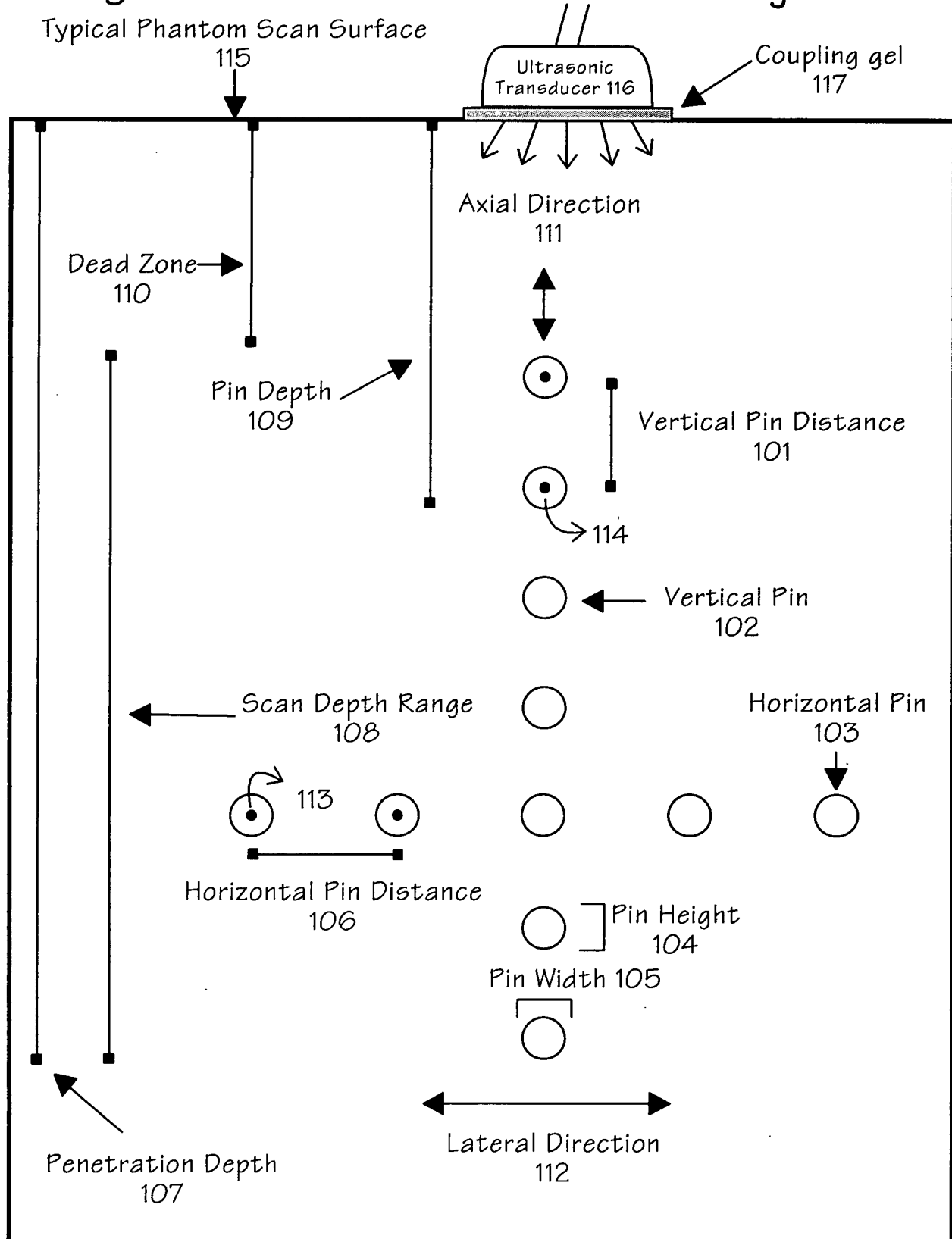


Figure 6. General Schematic-Outputs

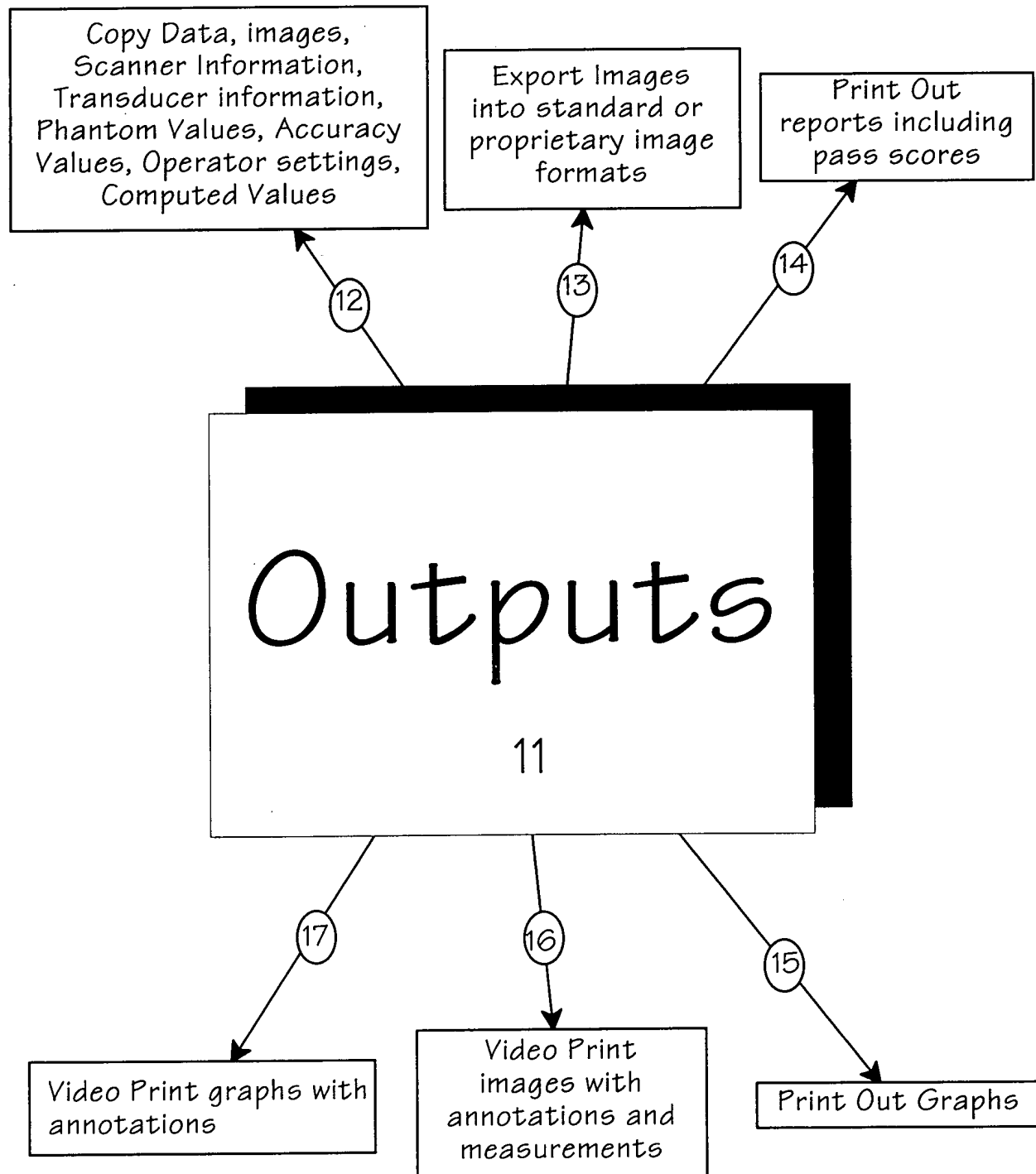


Figure 7: Display Example

In Operation

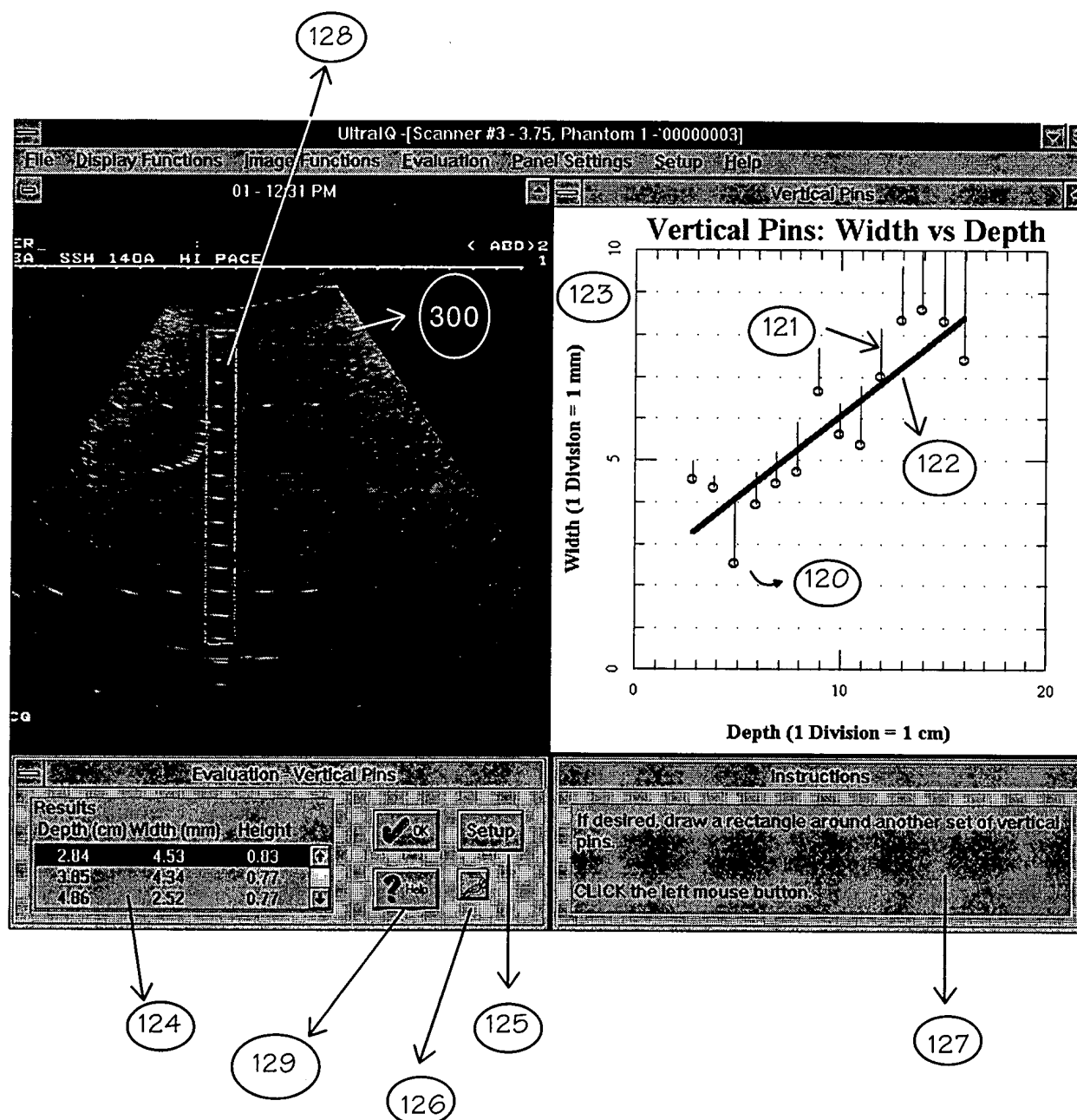


Figure 8. Example of Object Profile

Pin Object Gray Level Profile in Axial Direction

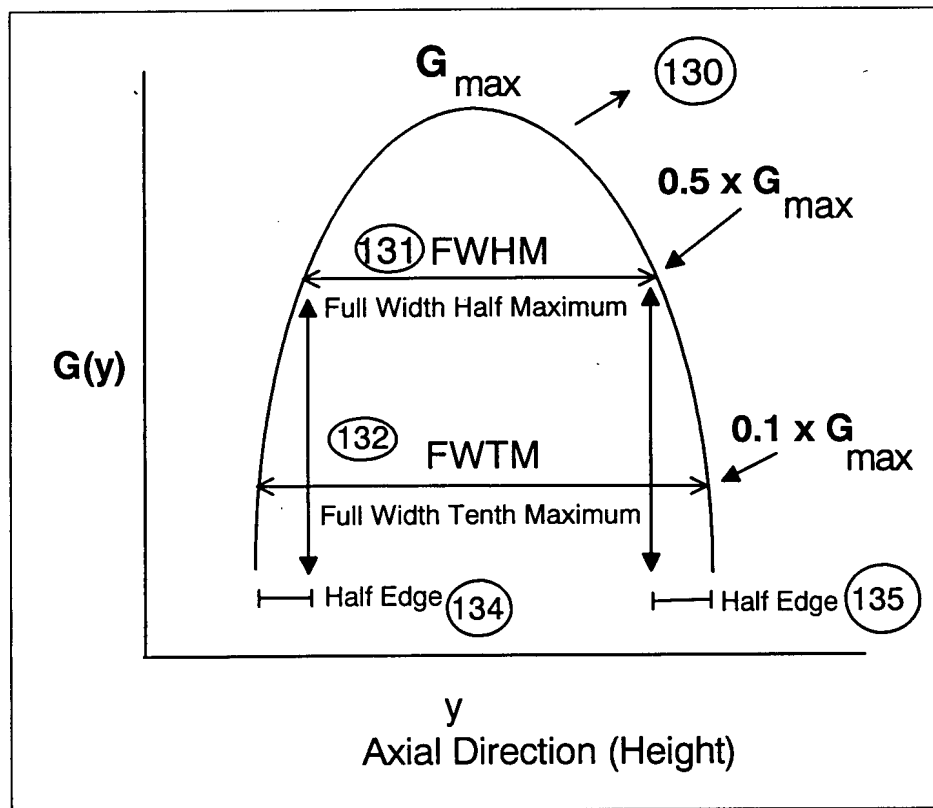


Figure 9. Typical Evaluation Operational Flow Chart

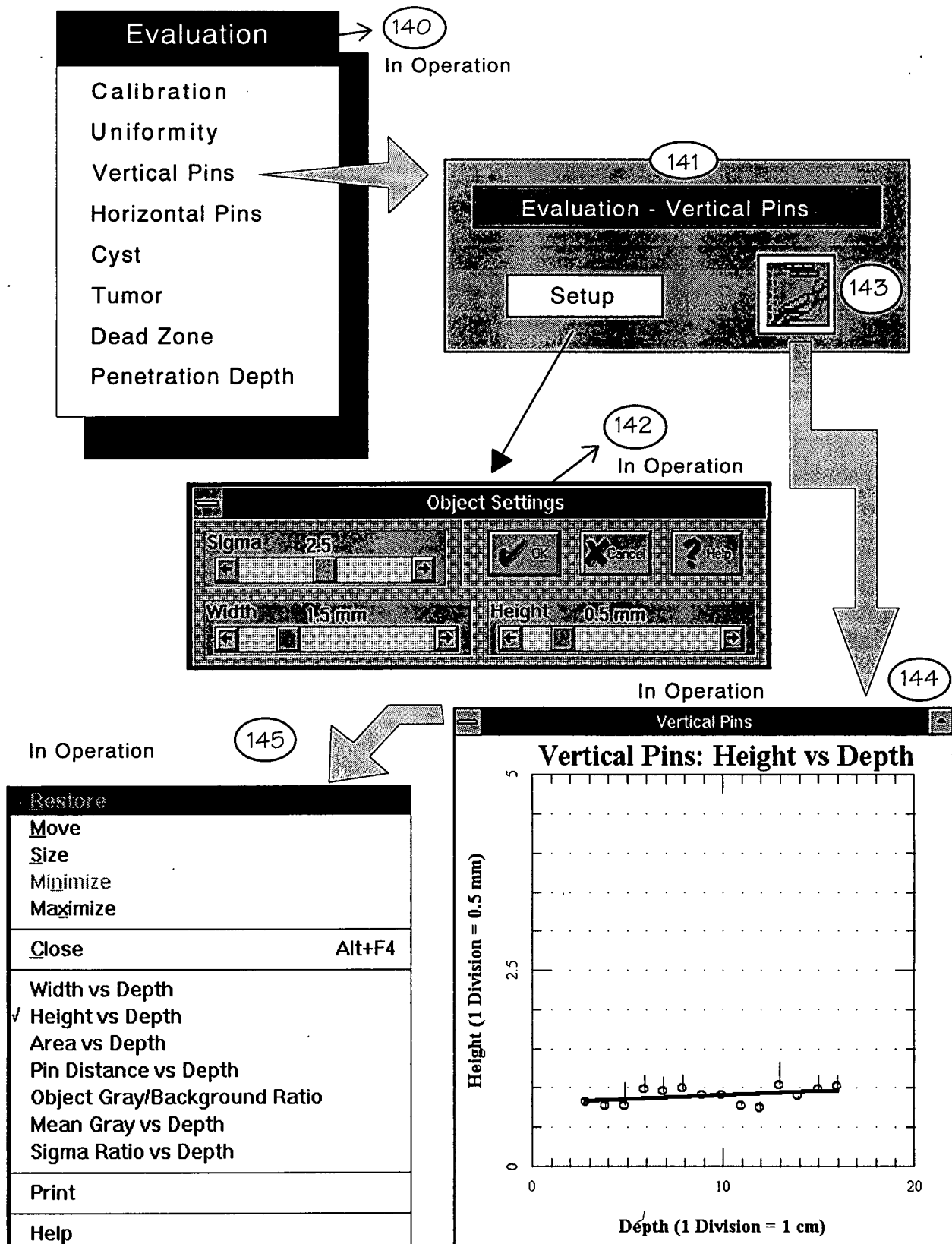


Figure 10. Typical Reports and Trends Operational Flow Chart

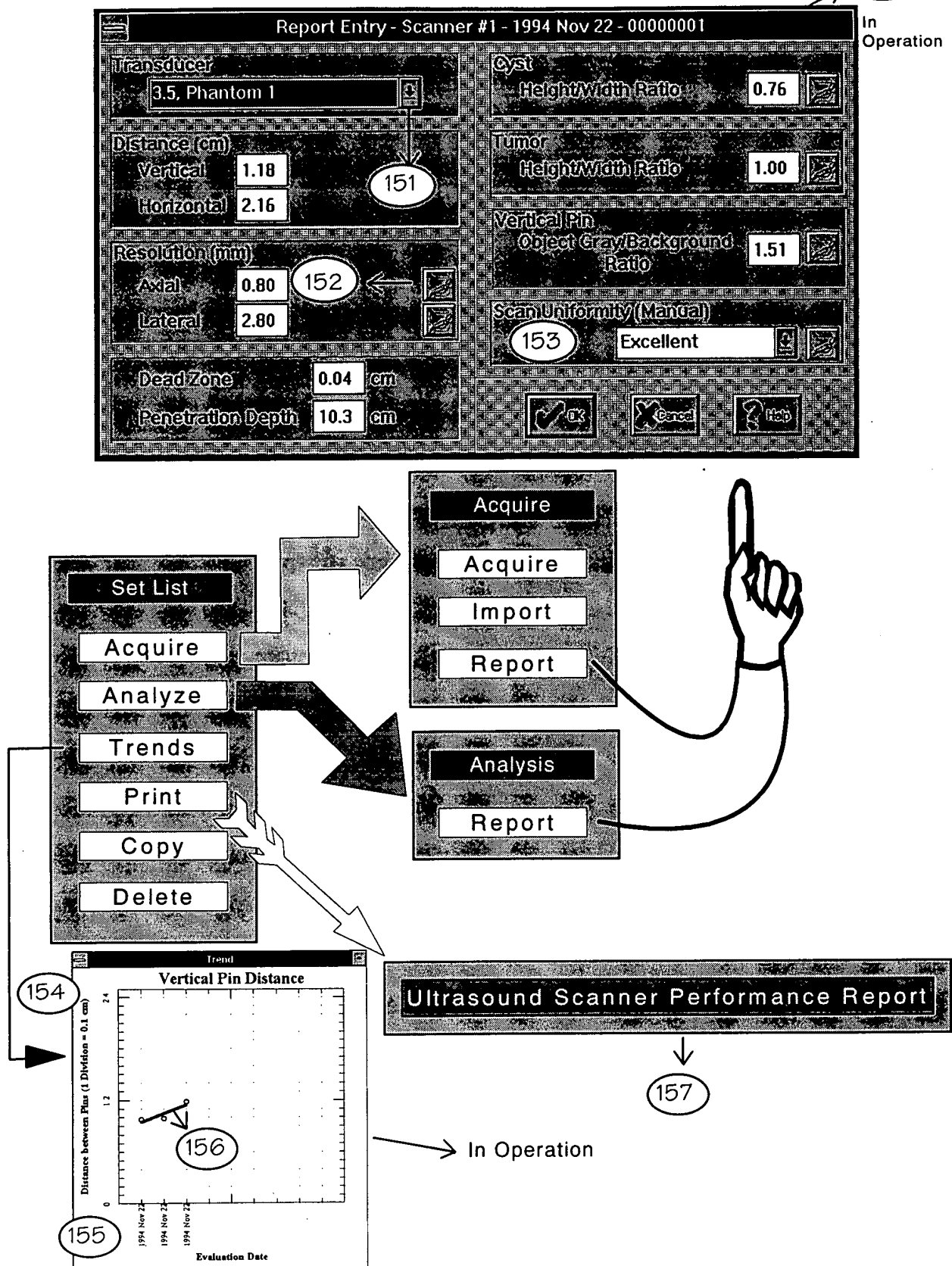
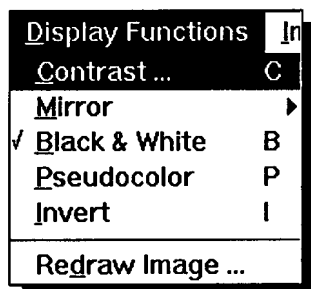
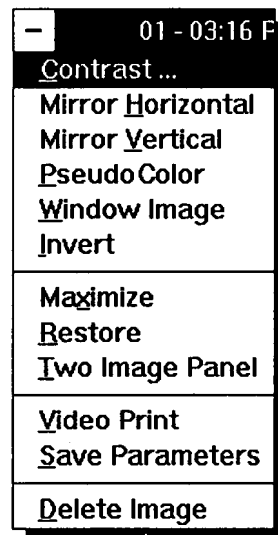


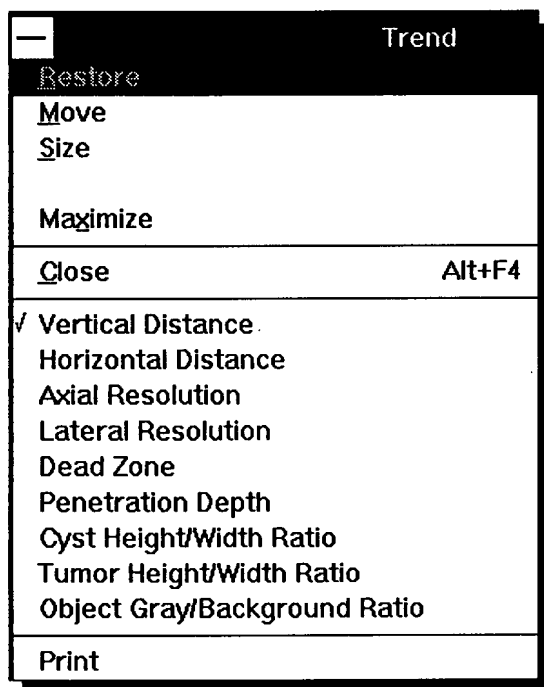
Figure 11. Typical Processing Menus - In Operation



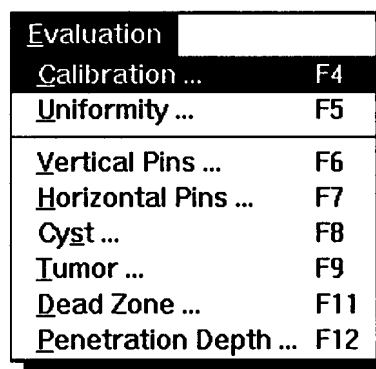
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Figure 12. Typical Dialog for Database Access - Operation

Scanner/Transducer List

Scanner	Location	Transducer
Scanner #1	Mississauga	3.5. Phantom 1
Scanner #1	Mississauga	5.0. Phantom 1
Scanner #1	Mississauga	7.5. Phantom 1
Scanner #2	Etobicoke	3.5. Phantom 1
Scanner #3	Markham	3.75. Phantom 1
Scanner #3	Markham	7.5. Phantom 1
Scanner #4	Hamilton	2.5. Phantom 2
Scanner #4	Hamilton	3.75. Phantom 2
Scanner #5	Toronto	3.5. Phantom 2

☒ OK

Set List - Scanner #1

Set Date	Set ID
1994 Nov 22	00000001
1994 Nov 22	00000008
1994 Nov 22	00000009

☒ OK

Figure 13. Typical Dialog for Accessing Tasks - Operation

**Figure 14. Typical Performance Parameters Entry Dialog
In Operation**

Phantom Values - Scanner #1, 3.5, Phantom 1

Distance (cm)		Resolution (mm)		Dead Zone	<input type="text" value=".4"/>	cm
Vertical	<input type="text" value="1"/>	Axial	<input type="text" value=".5"/>	Penetration Depth	<input type="text" value="10"/>	cm
Horizontal	<input type="text" value="1"/>	Lateral	<input type="text" value=".8"/>			

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Accuracy Values - Scanner #1, 3.5, Phantom 1

Distance		Resolution		<input type="button" value="OK"/> <input type="button" value="Cancel"/> <input type="button" value="Help"/>
Vertical	<input type="text" value="± 10"/> <input type="button" value="mm"/> <input data-bbox="625 1291 690 1333" type="button" value="%"/>	Axial	<input type="text" value="± 20"/> <input type="button" value="mm"/> <input data-bbox="1063 1291 1128 1333" type="button" value="%"/>	
Horizontal	<input type="text" value="± 15"/> <input type="button" value="mm"/> <input data-bbox="625 1344 690 1386" type="button" value="%"/>	Lateral	<input type="text" value="± 20"/> <input type="button" value="mm"/> <input data-bbox="1063 1344 1128 1386" type="button" value="%"/>	

Dead Zone	<input type="text" value="± 3"/> <input type="button" value="mm"/> <input data-bbox="560 1428 625 1470" type="button" value="%"/>	Penetration Depth	<input type="text" value="5"/> <input type="button" value="mm"/> <input data-bbox="1063 1428 1128 1470" type="button" value="%"/>
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Figure 15. Typical Performance Parameter Limits Entry Dialog - In Operation

Figure 16. Ultrasound Scanner Performance Report

Produced by VJAY RAMANATHAN
Measurements by VJAY RAMANATHAN

Date: 1995 Feb 20
Date: 1994 Nov 22

Scanner Name:	Scanner #3	Serial #	S3			
Manufacturer:	Company C	Model #	A3			
Location:	Toronto					
Transducer Name:	3.75, Phantom 1	Serial #	TRANS3.75			
Distance Accuracy:	Vertical Spacing	1.01 cm	Horizontal Spacing	2.12	cm	*
Spatial Resolution:	Axial	0.83 mm	Lateral	2.07	mm	
Scan Depth:	Dead Zone	0.73 cm	Penetration Depth	16.5	cm	
ObjectParameters:	Pin Object Mean Gray to Background Gray Ratio			2.27		
	Cyst Object Mean Height/Width Ratio			0.93		
	Tumor Object Mean Height/Width Ratio			0.75		
Scan Quality:	Uniformity/Artifacts			Excellent		
Transducer Name:	7.5, Phantom 1	Serial #	TRANS7.5			
Distance Accuracy:	Vertical Spacing	0.99 cm	Horizontal Spacing			
Spatial Resolution:	Axial	0.72 mm	Lateral	1.81	mm	
Scan Depth:	Dead Zone	0.57 cm	Penetration Depth	7.6	cm	
ObjectParameters:	Pin Object Mean Gray to Background Gray Ratio			18.90		

* - value to the left is outside acceptable range

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